**Teacher Notes**: **Cristy Langefeld**

**Mystery Powder Lab**

**4/12/11**

1. This purpose of this lab is to teach the students about diffusion and osmosis by using dialysis bags and cornstarch. Students will be given a mystery that they must solve to figure out what the mystery powder is. Students will use critical thinking skills while seeing the powder and water mixture in the dialysis bags change to a dark blue/black color.

2. This lab allows students to use skills including measuring water in beakers and graduated cylinders, measuring the powders, and gives them practice using a dialysis bag. Students will also use critical thinking skills to determine what happens to the mystery powder and why it does not happen to the known powders. The main objective of this lab is to have students see how a selectively permeable membrane works as well as diffusion and osmosis by allowing small iodine molecules through to react with the corn starch to produce a blue/black color. This lesson correlates with the Illinois Learning Standard Stage J: 12 A: 2 by discussing osmosis and diffusion across membranes.

3. First, students will complete the pre-lab questions and then move on to the experiment. Students will work in pairs and be given two 100 ml beakers, two dialysis bags (pre-soaked in water), a silver scooper, plastic spoon, scissors, kite string, a bottle of iodine, a vile filled with mystery powder (cornstarch), and a vile filled with a known powder. The known powders include baking powder, baking soda, powdered sugar, and baby powder. Students will tie one end of the bag with string and then fill one bag with the mystery powder and the other with the known powder. They will tie off the other end of the bags and place them in beakers filled half way with water. Finally, students will add 20 drops of iodine to the water and wait 15 min. During the 15 min, students will complete the questions and fill out the charts. After the 15 min, I will go through the questions with the class and have one person from each group write their known powder observations on the board. The class will write the information in their class data chart and the lab will be turned in for points.

4. This lab should take between 40 and 45 minutes depending upon how quickly the students fill and tie their dialysis bags.

5. It is important for the students to wear safety goggles while completing this experiment, because iodine is being used. Although not a very harmful substance, iodine would not be good to get in the eyes and it makes for good practice for students to get used to wearing safety goggles for future labs. The powder is also something to watch out for, to make sure it does not get into the students eyes when putting it in the dialysis bags.

6. The pre-lab discussion includes several questions including: the difference between osmosis and diffusion, defining the term selectively permeable and how cell membranes have this feature, molecules move from high to low concentration. Then, I would discuss what a dialysis bag is, what it is used for, and where it is used for.

7. It is very important to test this experiment before taking it to the classroom, because the dialysis bags might be touchy or be too thick, the amount of powder, water, and iodine used need to be certain amounts: a teaspoon of each powder with 5 ml of water in each bag and 20 drops of iodine with a half a beaker.

8. This lab will be completed in pairs at each lab station. Each group will contain the following materials to keep the students from moving around the room to get materials: two 100 ml beakers, two dialysis bags (pre-soaked in water), a silver scooper, plastic spoon, scissors, kite string, a bottle of iodine, a vile filled with mystery powder, and a vile filled with a known powder. The liquids will be measured by the students as well as the tying the dialysis bags and adding the powders and iodine. If directions are followed, this lab will work and results will be seen.